

Amendments to the Claims:

Applicants have amended claims 1-4, 8, 9, and 11, and added new claims 12-20. This listing of claims will replace all prior versions, and listings of claims in the application:

Listing of Claims:

- 1 1. (Currently Amended) A method of simulating relative motion of objects
2 in computer animation comprising ~~the steps of~~:
3 ~ providing a motion of a kinematic object, where the kinematic object is an
4 element of a computer animation display;
5 providing at least one dynamic object associated with said kinematic object,
6 where said at least one dynamic object is another element of the computer animation display and
7 where ~~motions~~ motion of said at least one dynamic object ~~are based on~~ is influenced by the
8 motion of the kinematic object, wherein the motion of said at least one dynamic object is
9 simulated using a physically-based numerical technique;
10 ~~selectively manipulating the motions of said at least one dynamic object to~~
11 simulate physical motion; and
12 manipulating the motion of said at least one dynamic object in response to the
13 motion of the kinematic object when the motion of the kinematic object exceeds a predetermined
14 threshold; and
15 displaying the elements of the computer animation display, including associated
16 motions of said elements.

- 1 2. (Currently Amended) A method of simulating relative motion of objects
2 according to claim 1 wherein ~~said step of selectively manipulating the motion of said at least one~~
3 dynamic object comprises compensating for ~~unreasonable~~ motions of said at least one dynamic
4 object when the motion of the kinematic object undergoes exaggerated motion exceeds the
5 predetermined threshold.

1 3. (Currently Amended) A method of simulating relative motion of objects
2 according to claim 2 wherein ~~said exaggerated the motion of said at least one dynamic object is~~
3 ~~manipulated when the motion of the kinematic object~~ comprises accelerations that are unrealistic
4 for humans.

1 4. (Currently Amended) A method of simulating relative motion of objects
2 according to claim 2 wherein ~~said step of selectively the manipulating~~ comprises compensating
3 for the ~~unreasonable motions~~ motion of said at least one dynamic object when the kinematic
4 object undergoes accelerated motions above a predetermined limit.

1 5. (Original) A method of simulating relative motion of objects according to
2 claim 1 wherein said kinematic object is an animated character and said at least one dynamic
3 object is coupled to the animated character.

1 6. (Original) A method of simulating relative motion of objects according to
2 claim 5 wherein said at least one dynamic object is a representation of hair attached to the
3 animated character.

1 7. (Original) A method of simulating relative motion of objects according to
2 claim 5 wherein said at least one dynamic object is a representation of clothing attached to the
3 animated character.

1 8. (Currently Amended) A method of simulating relative motion of objects
2 according to claim 1 wherein said at least one dynamic object comprises a first set of dynamic
3 objects and a second set of dynamic objects and ~~said step of selectively manipulating the motions~~
4 motion of said at least one dynamic object comprises selectively manipulating motions of said
5 first set of dynamic objects with respect to a first reference point on said kinematic object and
6 selectively manipulating motions of said second set of dynamic objects with respect to a second
7 reference point on said kinematic object.

1 9. (Currently Amended) A method of simulating relative motion of objects
2 according to claim 1 wherein said at least one dynamic object comprises a plurality of dynamic
3 objects coupled to a plurality of reference points on said kinematic object and wherein ~~said step~~
4 ~~of selectively manipulating the motions~~ motion of said at least one dynamic object comprises
5 manipulating the motions of each of said plurality of dynamic objects with respect to said
6 plurality of reference points coupled thereto.

1 10. (Original) A method of simulating relative motion of objects according to
2 claim 9 wherein said kinematic object is an animated character and said plurality of dynamic
3 objects are coupled to the animated character and said plurality of reference points are different
4 points on the animated character.

1 11. (Currently Amended) A method of simulating relative motion of objects
2 according to claim 9 wherein ~~said step of selectively~~ the manipulating comprises compensating
3 for ~~unreasonable~~ motions of said plurality of dynamic objects when the kinematic object
4 undergoes exaggerated motion.

1 12. (New) The method of claim 1 wherein manipulating the motion of said at
2 least one dynamic object comprises manipulating the motion of the said at least one dynamic
3 object when acceleration of the kinematic object exceeds the predetermined threshold.

1 13. (New) A computer animation system comprising:
2 a processor;
3 a display;
4 wherein the processor is configured to:
5 receive information specifying motion for a kinematic object;
6 compute motion for a dynamic object based upon the motion of the
7 kinematic object, wherein the motion of the dynamic object is specified using a physically-based
8 numerical technique; and

9 manipulate the motion of the dynamic object in response to the motion of
10 the kinematic object when the motion of the kinematic object exceeds a predetermined threshold;
11 and

12 wherein the display is configured to display the kinematic object and the dynamic
13 object and their associated motions.

1 14. (New) The method of claim 13 wherein the processor is configured to
2 manipulate the motion of the dynamic object when acceleration of the kinematic object exceeds
3 the predetermined threshold.

1 15. (New) The method of claim 13 wherein the kinematic object represents an
2 animated character and the dynamic object represents a hair attached to the animated character.

1 16. (New) The method of claim 13 wherein the kinematic object represent an
2 animated character and the dynamic object represents clothing attached to the animated
3 character.

1 17. (New) A computer animation apparatus comprising:
2 means for receiving information specifying motion for a kinematic object;
3 means for computing motion for a dynamic object based upon the motion of the
4 kinematic object, wherein the motion of the dynamic object is specified using a physically-based
5 numerical technique;

6 means for manipulating the motion of the dynamic object in response to the
7 motion of the kinematic object when the motion of the kinematic object exceeds a predetermined
8 threshold; and

9 means for displaying the kinematic object and the dynamic object and their
10 associated motions.

1 18. (New) A computer program product stored on a computer-readable
2 storage medium for simulating relative motion of objects, the computer program product
3 comprising:

4 code for receiving information specifying motion for a kinematic object;
5 code for computing motion for a dynamic object based upon the motion of the
6 kinematic object, wherein the motion of the dynamic object is specified using a physically-based
7 numerical technique;
8 code for manipulating the motion of the dynamic object in response to the motion
9 of the kinematic object when the motion of the kinematic object exceeds a predetermined
10 threshold; and
11 code for displaying the kinematic object and the dynamic object and their
12 associated motions.

1 19. (New) A computer-implemented method of simulating relative motion of
2 objects in computer animation, the method comprising:
3 receiving information specifying motion for a kinematic object;
4 computing motion for a dynamic object based upon the motion of the kinematic
5 object, wherein the motion of the dynamic object is specified using a physically-based numerical
6 technique; and
7 manipulating the motion of the dynamic object in response to the motion of the
8 kinematic object when the motion of the kinematic object exceeds a predetermined threshold.

1 20. (New) The method of claim 19 wherein manipulating the motion of the
2 dynamic object comprises manipulating the motion of the dynamic object when acceleration of
3 the kinematic object exceeds the predetermined threshold.